The Influence of Money on Prices in 14 OECD Countries 1958—19751)

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Abstract: A simple monetarist model is specified which has a reduced form relating the rate of change of prices to lagged price changes and current and lagged rates of change of money supply. The reduced form is estimated for 14 OECD countries using quarterly data for 1958—1975 and the stability of the estimated equations is examined. A policy of a constant rate of growth of money supply is found to imply a cyclical or fluctuating adjustment in the rate of price change.

The purpose of this paper is to specify a simple model of the relationship between the rate of monetary change and the rate of inflation and to estimate this relationship for a number of countries using quarterly data over the period 1958—1975. The model which we will construct is based on the tenets of monetarist theory. The essence of this theory is that in the long-run, when the actual and expected rates of inflation are equal, the rate of inflation will be equal to the rate of monetary expansion net of the income elasticity of real balances times the 'natural' rate of output change. Monetary change can affect real variables such as real output or unemployment in the short-run but this effect will only occur if the inflationary consequences of monetary change are unanticipated, giving rise to unanticipated inflation. Thus the essential hypothesis of monetary theory is that there is no long run trade-off between inflation and real variables. There can be a short-run trade-off, however, which will occur because of unanticipated inflation rather than the rate of inflation per se. [See Friedman, 1968, 1975].

It follows from the above that there need be no short run relationship between the rate of monetary change and the rate of inflation. [See e.g. Laidler/Parkin]. However, the nature of the short-run relationship between inflation and monetary change can be derived as a reduced form from our model. Our purpose is to derive and estimate such a relationship.

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1. The Model

Our model comprises the following equations: first, the demand for money is given by:

\[ m^d_t = p_t - \alpha_1 \Delta p^e_t + \alpha_2 y_t \]  \hspace{1cm} (1)

where

- \( m^d_t \) is the proportionate rate of change of money demanded
- \( p_t \) is the proportionate rate of change of prices
- \( \Delta p^e_t \) is the change in the proportionate rate of change of prices expected
- \( y_t \) is the proportionate rate of change of real output.
- \( \alpha_1 \) and \( \alpha_2 \) are constants.

Our demand for money function reflects the hypothesis that the demand for money is a demand for real balances which is determined in a stable manner by the level of real income and the opportunity cost of holding money, here proxied by the expected rate of inflation. (This could also capture the Fisher hypothesis that the nominal interest rate reflects the real rate, assumed constant, and the expected rate of inflation). Clearly, if \( \alpha_1 = 0 \) and \( \alpha_2 = 1 \) we have an old quantity theory formulation. This type of specification was adopted by Laidler [1973] in his study of the USA when he pursued a similar methodology of analysis as that outlined in this paper.

Secondly, the augmented Phillips curve (the accelerationist hypothesis):

\[ p_t = h \log \left( \frac{Y}{Y^*} \right) + p^e_t \]  \hspace{1cm} (2)

where

- \( Y \) is the level of real output
- \( Y^* \) is the level of trend real output
- \( h \) is a positive constant.

This essential element of monetarist theory gives the split between output and inflation. When the actual and expected rates of inflation are equal output will equal its trend level and unemployment will be at the 'natural rate'. Hence output is independent of the inflation rate. Otherwise output will be above or below the natural rate depending on the extent of unanticipated inflation. Empirical support for this equation is provided by e.g. Turnovsky/Wachter [1972], Turnovsky [1972], McCallum [1975], Parkin [1973], Duck et al. [1975].

Thirdly, the method of expectations formation

\[ \Delta p^e_t = \phi (p_{t-1} - p^e_{t-1}) \]  \hspace{1cm} (3)